

API 682 4th edition Sealing competence



A sealing system provider to count on: More than 21,000 EagleBurgmann API seals and systems installed world-wide.

India

EagleBurgmann has installed more than 7,000 API seals in a large number of refining and petrochemical plants.

Satorp refinery, Saudi Arabia

EagleBurgmann provides 400 sealing systems acc. to API 682 e.g., APIlex and H75 pusher seals.

Middle East and North Africa

In the MENA region, over 6,000 API 682 seals from EagleBurgmann are in operation.

Europe

More than 3,300 EagleBurgmann API seals are installed in numerous European refineries, petrochemical and oil & gas plants.

Leuna, Germany

Total-Refinery Mitteldeutschland (TRM) is equipped with over 700 sealing systems acc. to API in various configurations and arrangements.

Asia-Pacific

In the Asia-Pacific region, EagleBurgmann has installed over 2,300 API seals in a number of refineries and petrochemical plants for all major companies.

Service Contracts, Germany

Four major refineries in Germany benefit from our Service Contracts. EagleBurgmann takes care of the entire installed seal base.

Reliance Petroleum Ltd., Jamnagar, India

EagleBurgmann is the largest sealing solution provider with about 2,400 mechanical seals and sealing systems installed on more than 1,700 pumps.

Sohar, Oman

EagleBurgmann provides over 300 API 682 seals for the refinery and petrochemical complex and render various TotalSealCare services.



China

EagleBurgmann has installed over 1,200 API seals in different refineries and petrochemical plants for major companies like Sinopec and Petrochina.

BASF-YPC Co. Ltd., Nanjing, China

For this large scale chemical complex, EagleBurgmann is the main seal supplier with over 600 installed seals, many of them according to API 682.

Americas

More than 1,000 API 682 seals are installed in Brazil, Venezuela, Mexico, USA and Canada.

Fujian Refining & Petrochemical Co.Ltd., China

The majority of the critical pump applications were awarded to EagleBurgmann, supplying over 100 seals and supply systems to API 682.

Petróleos de Venezuela, S.A., Venezuela

PDVSA El Palito Refinery signed a frame contract with EagleBurgmann to modernize 40% of all mechanical seals to API 682 standard.

The API experts

EagleBurgmann is one of the leading international system providers of sealing technology. For more than 20 years we have been actively contributing our expertise to developing and implementing the API 682 standard for the selection and application of seals and supply systems in centrifugal and rotary pumps.

Solutions for more safety and productivity

The new 4th edition of API 682 is in line with the latest achievements and current developments. EagleBurgmann offers the widest portfolio of seals and seal supply systems acc. to API 682 4th edition, and consequently has the optimum product for each API-compliant requirement: technically mature, practical solutions that provide significantly greater safety and process reliability in refining technology, petrochemical, oil & gas and chemical industries.



Experience from more than 1,000 projects: Our products and services increase safety and efficiency.

The optimum solution – from the start

Our customers include leading pump manufacturers, engineering companies (EPC) and plant operators. We know all industry or plant-specific requirements through a continuous exchange and close cooperation: the basis for smooth cooperation along the entire process chain.

Full service partner with global presence

Research and development, consulting and engineering, layout and calculation, design and production and a wide range of modular services – these are types of expertise that our customers benefit from all over the world. A dense network of production facilities and sales and service centers means we are nearby whenever you need us.

Sealing solutions to meet any requirement

Several factors play a major role when choosing the product, the product type, the materials used and how it is operated: process conditions at the sealing location, operating conditions and the medium to be sealed.

No matter what requirements our customers have, we know how these factors affect functionality and economic viability, and we translate this expertise into outstanding long-term, reliable sealing solutions. EagleBurgmann has all the expertise needed to manage and support the entire development, life and service cycle of its sealing solutions.



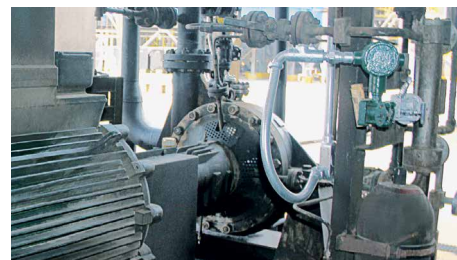
Thompson Byron Jackson cold service pumps circulate light hydrocarbons in the Santos Moomba gas plant in **Australia**. Reliably sealed by EagleBurgmann dual pressurized API type A seals, supplied by a Plan 53C barrier fluid system (max. 40 bar (580 PSI)). Configuration 3CW-BB, piping plans 53C and 61. Seal pressure: 10% above discharge pressure (32 bar (464 PSI)), $t = -20\text{ °C} \dots +38\text{ °C}$ ($-4\text{ °F} \dots +100\text{ °F}$), $n = 1,480\text{ min}^{-1}$.



A Sulzer HDS feed pump type GSG 100-300 is applied at Total Refinery in Leuna, **Germany**. Sealed by an EagleBurgmann API balanced pusher seal with containment seal (configuration 2CW-CS). Piping plan 75 (EagleBurgmann gas supply and leakage collection systems). Operating conditions: $p = 6\text{ barg}$ (87 PSIG), $t = \text{max. } 120\text{ °C}$ (248 °F), $n = 2,980\text{ min}^{-1}$. Medium: Hydrocarbon (Kerosene).



In the Refinery Complex Amuay-Cardón run by Petróleos de **Venezuela**, S.A. our seals are installed in about 90 of the most demanding services. In one of the critical applications, the BB5 Pacific pumps are successfully sealed with dual EagleBurgmann API type A seals and appropriate supply systems. Configuration 3CW-BB, piping plans 02 and 53B. Operating conditions: $p = 18\text{ bar}$ (261 PSI), $t = 200\text{ °C}$ (392 °F), $n = 3,600\text{ min}^{-1}$. Media: Naphtha and Gasoil (3% H₂S).



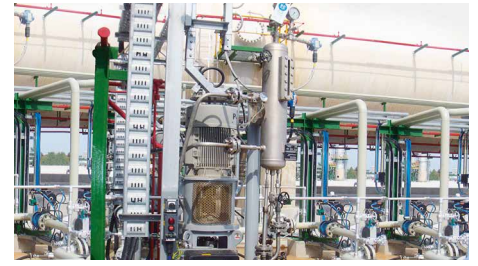
To convey sour water with high SO₂ content, a Weir pump is installed in the fluid catalytic cracker (FCC) of the Amuay-Cardón refinery in **Venezuela**. The shaft is sealed by dual pressurized EagleBurgmann API type A seals and equipped with a barrier fluid system with bladder accumulator. Configuration 3CW-BB, piping plans 02 and 53B. Operating conditions: $p = 15\text{ bar}$ (218 PSI), $t = 50\text{ °C}$ (122 °F), $n = 3,600\text{ min}^{-1}$.



De-ethanizer pump in a LPG fractionation unit of ENOC refinery, **U.A.E.** equipped with an unpressurized dual EagleBurgmann sealing system acc. to API 682. Configuration: 2CW-CS, piping plans 14 and 76. Operating conditions: $p = 36 \dots 39 \text{ bar}$ (522 ... 566 PSI), $t = 1 \text{ }^\circ\text{C} \dots 43 \text{ }^\circ\text{C}$ (34 °F ... 109 °F), $n = 2,933 \text{ min}^{-1}$. Medium: LPG. Since installation, MTBF improved drastically.



Since commissioning in January 2009, one of the critical pumps in the Bangchak refinery, Bangkok, **Thailand** performs well with a dual EagleBurgmann API type C metal bellows seal with an unpressurized buffer fluid system. Configuration: 2CW-CW, piping plans 23, 52. Operating conditions: $p = 1.6 \dots 5.6 \text{ barg}$ (23.2 ... 81.2 PSIG), $t = 302 \text{ }^\circ\text{C}$ (576 °F), $n = 1,470 \text{ min}^{-1}$. Medium: High temperature hydrocarbon.



PTT Phenol in Rayong, **Thailand**, operates in its plant a vertically suspended double-casing volute pump. It is sealed with an unpressurized dual EagleBurgmann API type A seal. Although the application is most critical, the seal performs well since May 2008. Configuration: 2CW-CW, piping plans 11 + 52. Operating conditions: $p = \dots 20 \text{ barg}$ (290 PSIG), $t = 15 \text{ }^\circ\text{C} \dots 40 \text{ }^\circ\text{C}$ (59 °F ... 104 °F), $n = 2,930 \text{ min}^{-1}$. Medium: Propylene.



In Xinjiang, **China**, CNPC PetroChina Dushanzi Petrochemical Co. Ltd., operates an ethylene cracker based on Linde technology. In one of the typical low temperature applications, a vertical inline pump from Ruhrpumpen is sealed by an EagleBurgmann dual metal bellows seal that is supplied by a barrier fluid system with piston accumulator. API configuration 3CW-FB, piping plans 02, 53C, 61. The medium is Methane. Operating conditions: $p = 33 \text{ barg}$ (479 PSI), $t = -97.16 \text{ }^\circ\text{C}$ (-142.89 °F), $n = 2,925 \text{ min}^{-1}$.



In the LNG processing plant at Cacimbas, **Brazil**, 238 pumps are applied. 75% of them are equipped with EagleBurgmann seals. For pumping C2+, Sulzer type CAP8 80-430 pumps are installed. Shaft seals are EagleBurgmann API type C seals. Configuration 2CW-CW, piping plans 13, 21, 52 and 65. Liquefied propane is used as cooling fluid for Plan 21 and 52. Operating conditions: $p = 34 \text{ barg}$ (493 PSI), $t = -45 \text{ }^\circ\text{C} \dots +120 \text{ }^\circ\text{C}$ (-49 °F ... +248 °F), $n = 3,565 \text{ min}^{-1}$.



A dual EagleBurgmann API type C double ply bellows seal performs well in a Kirloskar Ebara debutanizer reboiler pump which is installed in the RPL refinery complex in Jamnagar, **India**. Configuration: 2CW-CW, piping plans 21, 52. Shaft diameter: 130 mm (5.12"). Operating conditions: $p = 19.3 \dots 21.1 \text{ bar}$ (280 ... 307.5 PSI), $t = 274 \text{ }^\circ\text{C} \dots 317 \text{ }^\circ\text{C}$ (525 °F ... 603 °F), $n = 1,500 \text{ min}^{-1}$. Medium: Aromatic hydrocarbon.



Fujian Refining & Petrochemical Co., Ltd. in **China** applies a BB2 pump for propane de-asphalting. The shaft seal is an EagleBurgmann API type A seal. Configuration 2CW-CW, piping plans 21+52. Operating conditions: $p = 73 \text{ barg}$ (1,059 PSIG), $t = 165 \text{ }^\circ\text{C}$ (329 °F), $n = 2,970 \text{ min}^{-1}$.



In the naphta processing of a refinery in **Germany**, a 4 ROV 2-stage pump (Ruhrpumpen) is sealed with EagleBurgmann API type A dual pressurized pusher seals. Configuration 3CW-BB, piping plans 53B + 62 (nitrogen). Operating conditions: $p = 37 \text{ bar}$ (537 PSI), $t = 100 \text{ }^\circ\text{C}$ (212 °F), $n = 2,975 \text{ min}^{-1}$. The seal was retrofitted from single to dual in order to comply with the German Clean Air Act (TA-Luft).



In the Toa Oil FCC Plant in **Japan** the Sundryne API 610 type OH6 reactor recycle pump handling Butane is operating successfully with a dual pressurized face-to-back EagleBurgmann API 682 type A pusher seal. It runs with plans 13/54 at $20,000 \text{ min}^{-1}$ at a sealing pressure of over 66 bar (957 PSI).

API 682 4th edition solutions at a glance: EagleBurgmann product locator for mechanical seals and seal supply systems.

Category		Category 2 and 3										
Configuration		1CW-FL	2CW-CW	2CW-CS	2NC-CS	3CW-FB	3CW-BB	3CW-FF	3NC-FB	3NC-BB	3NC-FF	
Mechanical Seals	Seal type A	ROTATING	H75VA4-S LL9UC	H75A4-T LL9DTUU	H75A4-C LL9DTUE	H75LG4-C	H75A4-T LL9DTUU	H75A4-B LL9DKUU		CGSH-KD		
		STATIONARY	LEK777 SH	LL9DJUU	LL9DJUE		LL9DJUU		LL9DSUU SH-D	HRGS-DD LNF992		RGS-D
	Seal type B	ROTATING	LY9SA	LY9DTSS			LY9DTSS	LY9DZSS				
	Seal type C	ROTATING	MBS682	MBS682-PTA			MBS682-PTA	MBS682P-D				
		STATIONARY	LY9TC	LY9DZTT			LY9DZTT		LY9DSTT			
Engineered seals		Beyond API specifications, EagleBurgmann offers a comprehensive range of engineered seals and systems, tailored to customers specifications. Please inquire.										
API piping plans	PROCESS SIDE	Plan 01	■	■	■		■	■	■	▲	▲	▲
		Plan 02	■	■	■	■	■	■	■	■	■	■
		Plan 03	■	■	■	■	■	■	■	■	■	■
		Plan 11 (12)	■	■	■		■	▲	▲	▲	▲	▲
		Plan 13	■	■	■		■	▲	▲			
		Plan 14	■	■	■		■	▲	▲			
		Plan 21 (22)	■	■	■		■	▲	▲	▲	▲	▲
		Plan 23	■	■	■		■					
		Plan 31	■	■	■		■	■	■	▲	▲	▲
		Plan 41	■	■	■		■	■	■	▲	▲	▲
		Plan 32	■	■	■		■	■	■	▲	▲	▲
		BETWEEN SEALS	Plan 52		■							
	Plan 55			■								
	Plan 53A						■	■	■			
	Plan 53B						■	■	■			
	Plan 53C						■	■	■			
	Plan 54						■	■	■			
	Plan 72 (71)				■	■						
	Plan 74									■	■	■
	ATMOSPHERIC SIDE	Plan 51	■									
Plan 62 (61)		■	▲			▲	▲	▲				
Plan 65A		■	▲			▲	▲	▲				
Plan 65B		■	▲			▲	▲	▲				
Plan 66A		■										
Plan 66B		■										
Plan 99	■	■	■	■	■	■	■	■	■	■		

■ Recommended ▲ Possible

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EagleBurgmann, a joint venture of the German Freudenberg Group and the Japanese Eagle Industry Group, is one of the internationally leading companies for industrial sealing technology. Our products are used everywhere where safety and reliability are important: in the oil and gas industry, refining technology, the petrochemical, chemical and pharmaceutical industries, food processing, power, water, mining, pulp & paper, aerospace and many other spheres. Every day, more than 6,000 employees in more than 60 subsidiaries contribute their ideas, solutions and commitment towards ensuring that customers all over the world can rely on our seals. Our modular TotalSealCare service underlines our strong customer orientation and offers tailor-made services for every application.

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